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An examination of the physical and the digital qualities of humanities research

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Abstract

Traditionally humanities scholars have worked in physical environments and with physical artefacts. Libraries are familiar places, built on cultural traditions over thousands of years, and books are comfortable research companions. Digital tools are a more recent addition to the resources available to a researcher. This paper explores both the physical and the digital qualities of modern Humanities research, drawing on existing literature and presenting a study of Humanities scholars' perceptions of the research resources they use. We highlight aspects of the physical and digital that can facilitate or hinder the researcher, focusing on three themes that emerge from the data: the working environment; the experience of finding resources; and the experience of working with documents. Rather than aiming to replace physical texts and libraries by digital surrogates, providers need to recognise the complementary roles they play: digital information environments have the potential to provide improved access and analysis features and the facility to exploit the library from any place, while the physical library and resources provide greater authenticity, trustworthiness and the demand to be in a particular place with important material properties.

Keywords

Physical Libraries, Digital Libraries, Humanities Scholars, Information seeking behaviour

1. Introduction

There are many digital resources to support Humanities scholars that are either currently available or under development (e.g. AHDS 2006, Intute 2006). This introduction of digital resources is changing the ways that scholars work. However it has been suggested that many of these digital environments have been designed and developed using predictions based on “local experience, anecdotal evidence and good intentions” (Wilson 2003), rather than formal user requirements research. The traditional physical library has been built up on cultural traditions spanning two thousand years and has been described as “the humanists’ laboratory” (Burchard 1965): the library materials of the humanities scholar are often their research objects. If digital and physical resources are to be developed to complement each other, their different properties and potential values and uses need to be well understood.

In this paper we highlight these often-implicit qualities, reporting from a recent set of interviews with humanities scholars as well as drawing from the literature. We then highlight what can be learned from these findings in the development of future digital resources designed to support their research activities.

2. Background

The literature on digital libraries in the Humanities focuses on the greater access that digital libraries offer – set against the ongoing challenge of facilitating that access. There has also been consideration of the challenges of creating high fidelity digital surrogates of historical materials, and some comparison of users’ experiences in physical and digital libraries. Finally in this section, we present a brief overview of work comparing the physical and the digital in other domains.

2.1 Digitisation and access

There are many advantages to digital resources that support the information needs of scholars and these have been widely reported in the literature (see Lesk (2005) for a comprehensive overview). In particular they offer us convenient, fast access to a far wider selection of materials than we might expect in a physical library, often with additional facilities that enhance our interaction with the materials and allow us to engage with artefacts in more advanced ways (e.g. full text search).

A physical collection may be unique, or of national or international importance, but only available to a limited number of researchers. The process of digitization can bring acclaim to a collection and its host institution, thus providing an opportunity to promote itself and its resources to a wider community (Youngs 2001). An institution may also wish to showcase a new technology in the hope that it will draw such interest, like the British Library’s ‘Turning the Pages’ project, which allows interaction with the digital surrogates in a manner that emulates the real world interaction – it looks as if one is actually turning the pages on the screen (British Library 2007).

Viewing the digital version of a rare artefact physically housed in, for example, the British Library online may be an attractive alternative to travelling to London and

following various bureaucratic processes in order to (potentially) be granted limited access to the original. To stand a chance of seeing the original at the British Library, as reader has to have first consulted the available surrogates, including published facsimiles and microfilms. Obtaining a Reader's Pass involves providing proof of identity and passing through a number of security procedures in order to see the original that would take place under careful supervision. A further process is negotiated if one actually wants to handle the artefact, and the item's specialist curator strictly evaluates such requests. In this example, interacting with the digital surrogate may be far less inconvenient and expensive for the researcher.

Deegan and Tanner (2002) claim that digital formats are favoured over their analogue counterparts because they provide immediate access to items that are in high demand, they allow easier access to individual components within items (sections of the text, illustrations etc) and host tools can enhance an image's size, sharpness, colour contrast etc.:

"What users want is the resource and the information: they may be less interested in the format of that information. Format is only relevant when it impedes retrieval: if a book is available on a shelf nearby, then that would be as useful as an electronic text, but if the book is unique and is only available in physical form many thousands of miles away, then an electronic text will serve the purpose. The main goal of the ... library is to find the shortest path between expression of an information need and its satisfaction, and also to provide the unexpected to the user." p62/63

Dalbello (2004) discusses how digitized collections can facilitate reproduction and multiplication at the same time as removing objects from the context of the traditional library. This can reduce an object's "aura" as a unique item of a particular time and context. In discussing her own study of a range of digital library projects she suggests that "strategies of contextual recovery of objects" afforded by these libraries are "crude and elicit what may be called picturesque voyages that allow for episodic engagement with the materials" (p288). Wood (2000) argues that often the digitisation of a rare artefact can actually enhance the mystique and "aura" of the physical object, increasing the requests for access to the original; she cites the example of the digitisation of the Domesday Book, which led to such increased demand for access the original that it had to be removed from the search room of the Public Records Office. Indeed the archivists' steps to restrict or prevent access by imposing 'ritualistic actions' serve to increase the object's value, generating further curiosity and enhancing the object's uniqueness and mystique. Wood's paper explores the reasons behind many objects held in archives being fetishised, asking, "what is the difference between information and the medium on which that information has been inscribed? Is the nature of information such that man will be satisfied to receive it in surrogate form, and then not care if the original is discarded?" (p20).

Liu (2006) reviewed the literature on peoples' perceptions and preferences for print and electronic resources and carried out his own survey of graduate students at San Jose State University. He found that reading preferences and the use of print and electronic resources vary among different disciplines although the categorisations offered in the paper are too broad to distinguish the humanities subjects from other disciplines. His results echo those of other studies that have identified a shift towards the use of electronic

resources and the World Wide Web as a first stop for addressing scholars' information needs. He notes that an entire generation is growing up with new technology, and this may have implications for their expectations of and preferences regarding the choice between digital libraries and traditional libraries. Liew et al (2000) and Sathe et al (2002) found from their surveys that participants preferred electronic journals over print journals for such commonly cited reasons as improved searching capabilities, links to additional resources, currency, availability and ease of access and printing. Wilson (2003) reported that continuous 24 hour access in the comfort of one's home is gaining considerable popularity, as is demonstrated by university faculty and students preferring remote use of online information to handling print editions within the geographical constraints of the library. Within many of these studies the distinction between journals and books can become a little blurred.

2.2 “If we build it they will come”

Despite the advantages of digital media outlined above, there has been lower take-up and use of many digital repositories than their developers anticipated. This is often explained by reference to the mantra “If we build it they will come”, a quotation from the movie ‘Field of Dreams’ which has been widely adopted by the Digital Humanities community. As Michel (2005) explains; “this has been a guiding principle behind much archival and special collections’ thinking about their collections. That the value of their collections is so inherent, so critical an aspect of our cultural heritage, that if people were only aware of the existence of such resources they would flock to us as magi following the star of Bethlehem. Our job was to create the guiding star, and if they in their blindness cannot find the star we will transport the manger virtually to their doorstep.” (p386). Likewise, Wilson (2003) suggests that for the most part many projects are developed as “we build it, hoping people will come, without knowing what we are building, or precisely who will be coming” (p19).

Jones et al (1999) suggest that “If we build it they will come” may have been a sufficient model of user interests and behaviour in the earlier days of digital libraries, but modern times require us to proactively address the needs and challenges presented by libraries’ intended users. Additionally, Warwick et al (2006a) remind us that many projects have been publicly funded to deliver digital resources for use by humanities scholars and, whilst some are well known, others have been relatively forgotten, suggesting that this may be a waste of intellectual effort and public funding. Their research with humanities scholars suggests that it is not the lack of knowledge of what resources are available but perceived shortcomings in resource quality and fitness for their research purpose that deters users from employing digital resources. There is therefore a need to take into consideration the difficulties inherent in creating a digital edition of an object that satisfies the needs of every researcher.

2.3 Presentation of the artefact digitally

Transferring three-dimensional objects to two dimensions through digitisation can limit a user's engagement with that object because, for example, of the quality of images and limitations of screen size. Indeed, when using images for academic research, the scholar

needs to know whether the image is a faithful reproduction or whether it has been enhanced or altered in any way (Frost 2002). Before the advent of digital resources, it was suggested that scholars who criticise or study the history of paintings, sculptures or buildings ought to see the originals (Burchard 1965). Many modern digitisation projects go to great lengths to reproduce an artefact as a true surrogate. For example, in 1998, Octavo produced a digital version of the 1896 Kelmscott Edition “Works of Geoffrey Chaucer” that was intended “to reduce, rather than increase, requests to see precious and fragile originals.” The digital facsimile conveys a sense of features of the original such as the layout of the double-page spread, the grain of the paper, and the faint colour and impression of printed matter visible through the paper (Hansen, Morrison & Gryce 2003).

“The value of a rare book, manuscript, or other artefact encompasses much more than simply the text and data it contains – a flat scan of a book’s text block does not tell its whole story. Such a reproduction cannot convey the richness of the object: its physical form; the materials of its construction; the style and workmanship of its bindings. Failing to produce an adequate surrogate for both appreciation and study has a tendency to limit digitisation to the publicising of materials, incurring further requests to view the original.” p3

Deegan and Tanner (2002) remind us that there are many methods for encoding, storing and retrieving digital data that relies on cross compatibility in order to optimise its usefulness. Another concern is over the permanence of some digital data. For example, the BBC’s Digital Domesday Project suffered a setback as data became unreadable after just 15 years when the technology required to play the video storage disks had become obsolete (Schofield 2003). The original physical copy remains readable almost one thousand years after its production. Yet in order to make the information accessible online, the National Archives was forced to repeat the entire digitisation process (TNA 2006). This is far from being an isolated case, as Ross and Gow (1999) have shown.

2.4 Presentation of the artefact physically

The study of history is described as being “enabled through access to artefacts of earlier times and people...and many areas of scholarship, research and education could not be carried out without access to physical objects” (Furuta et al 1996 p109). Such objects are intrinsically impermanent and susceptible to change through use as well as from the surrounding environment. As a physical object is unique, it can only be in one place at a time, and culturally collection managers will seek to restrict access to the object: preservation versus access (Forde 2005). A digital representation of the physical object frees it from the shackles tying it to one place and if borrowed it does not make it unavailable to anyone else. A traditional library (or museum) as a place allows us to experience its space and content, to absorb surrounding ambience and encounter real objects, perceive scale, texture and true colours as well as ignite other senses such as sound and smell. Chiu et al (2004) acknowledge that the handling of the physical book may be an “enjoyably exquisite” part of the information seeking process whereas the experience of engaging with digital libraries is “often dull and the presentation of their documents rather bland”. Their project used realistic visualisations of interaction that increased the perceived value of a digital library system. In the same vein, one of our Postgraduate students described her experiences of using the original manuscript for

Alice's Adventures Underground (that went onto become Alice's Adventures in Wonderland). This rich description gives us an excellent insight into the almost ethereal qualities of her experience of the physical when compared to the digital.

“But where expediency is attractive in a practical sense, sometimes convenience cannot replace authenticity, or, in the case at hand, a 142 year old leather-bound, hand-written manuscript that became one of the most popular and influential works of children's literature. Not even a digital facsimile can evoke the awe one feels when peering down through the glass at the original manuscript in the dimly lit John Ritblat Gallery. Seeing the real Alice is something most people will never experience; those who do will likely be affected in the same manner as when one views a famous painting or ancient monument. Even though the content of the digitised facsimile and manuscript are the same, viewing the text on-line evaporates much of the magic that enfolds the original edition.” (Lukow 2005)

Even when the physical object is unavailable, it is apparently still regarded as the “gold standard” for study. A recent report on peer review of digital content in the Arts and Humanities (IHR, 2007) even found scholars who admitted that they cite the print version of a resource even if they have actually only consulted the digital edition, for reasons of scholarly prestige. The report suggests that the practice is relatively common. They even recommend that instructions for authors in journals should insist that digital editions are cited, as a means of increasing the acceptance of digital resources as respectable sources.

2.5 The physical and the digital in other domains

In other domains, such as computer science, medicine and education, researchers are developing an understanding of the relationship between the physical and the digital.

Stelmaszewska and Blandford (2004) studied the behaviour of a group of computer scientists whilst using a physical library. They focused on how they interacted with artefacts, evaluated them and interacted with librarians. Their study highlighted the fact that the library metaphor is limited in terms of how experiences can be transferred from the physical to the digital environment. Users' experiences of using paper, books, shelves and other tangible media are different from those of using computer keyboards, screens and other technology designed to facilitate interaction with digital information. One important theme from this study is that the digital library is not a simple replacement for the physical one, but affords different experiences and supports different interactions with research materials.

Equator was a six-year interdisciplinary research collaboration across several UK institutions that sought to address technical, social and design issues in the "development of new inter-relationships between the physical and the digital" (Equator 2007). One Equator study looked at the library of Early Women's Literature at Chawton House, England (Halloran et al 2005). Working alongside the curators, they designed new visitor experiences involving technology-enhanced interactions using portable devices and location-sensors. Their research revealed a range of visitor interests in the same site, such as the landscape, the flora and fauna or how the environment influenced the works of Jane Austin. They looked at ways of devising different experiences to different groups of visitors that could be facilitated by different organisers (school teachers, curators etc.).

Another important theme concerns the quality of the fit between system design and user practices. Fitzpatrick (2000) reported in her study of paper records in healthcare settings how these are embedded in the social, spatial and organisational milieu of the hospital. Based on these findings she suggests that the design of technology for healthcare should start with the question “how do we support clinical practice?” which requires that we understand more about that practice.

To design digital resources that support humanities scholars, we need to better understand their research experiences and practices. This is particularly important as, unlike in traditional libraries, digital library users are usually invisible to librarians (and designers). Early and constant engagement with potential users is vital in order to better understand their expectations in order to serve them more effectively (Giersch et al 2004). To this end, an interview-based study has been conducted with humanities scholars, as reported below.

3. Methodology

The aim of the study was to better understand the research experiences of humanities scholars and to investigate how other services, people, tools and artefacts fit into their scholarly work. This should inform the design of tools to support those research practices, and our goal was to enable this knowledge transfer.

Interviews were arranged with humanities scholars in order to map out their research working practices and in particular their information seeking practices. Data were collected using open-ended questions as set out in Appendix A. These questions were intended to cover key aspects of how humanities scholars carry out their research, and their experiences of interacting with physical and digital resources.

The sample of scholars was one of convenience: some participants were contacted directly (e.g. through being known by a member of the project team), while others responded to a request for participation that was circulated via departmental offices. In addition, four Postgraduate students were contacted through the faculty members who responded. Confidentiality was assured, and each participant was assigned a code according to the order of the interviews. Outline profiles of participants are provided in Table 1.

Interviews were conducted between July 2005 and April 2006, were face-to-face and at the participant’s Institutional place of work. The same researcher was the interviewer at all sessions. Interviews were captured using a digital voice recorder and transcribed verbatim. They were systematically analysed by two independent researchers, each iteratively working through transcripts, coding the data and identifying and cross-relating key themes. The approaches used were based on thematic analysis techniques described by Wetherell, Taylor and Yates (2001) and Emergent Themes Analysis (Wong and Blandford 2002).

ID	Department	Post	Location	Approx. Time in the field (years)	Gender
P1	English	Faculty	London	30	Male
P2	English	Faculty	London	30	Male
P3	English	Faculty	London	25	Female
P4	English	Faculty	London	25	Female
P5	English	PhD	London	5	Female
P6	Buddhism	Faculty	Bangkok	30	Male
P7	History	PhD	Brighton	20	Female
P8	History	Faculty	Cambridge	25	Male
P9	History	Faculty	Cambridge	20	Male
P10	History	Faculty	Cambridge	20	Male
P11	History	PostDoc	Cambridge	10	Female
P12	History	Faculty	Sydney	25	Male
P13	English	Faculty	London	25	Female
P14	History	PhD	Cambridge	10	Male

Table 1. Participant details

4. Findings and Discussion

Three main themes relating to issues of physicality and the digital emerged from the data, and are the focus of this paper. These were: the working environment; finding things; and working with artefacts. For clarity of reporting, stumbling and hesitations have been removed from the illustrative quotations where they do not carry any interpretative meaning, and names of people and places have been anonymised by replacing them by codes. Participants are referred to by the participant codes listed in Table 1.

4.1 The working environment

Participants reported placing great store by the importance of, and problems of, places such as libraries, auction houses, book fairs, and spaces provided to support their work. All participants offered opinions and preferences on a variety of working spaces within places, predominantly major libraries.

The first, and perhaps most obvious, aspect of the working environment is how easily it enables the scholar to access the required materials. For example, the Buddhist scholar had carried out his postgraduate degrees and post-doctorial research in London and Oxford, both homes to ancient Buddhist texts. Travelling to work with these texts was relatively quick and cheap whilst living and working in the UK. Now he is geographically displaced from these physical items and relies on photocopies, and is working in an institution with significantly less funding opportunities to travel to work with other texts within the Asian region.

The majority of scholars interviewed for this study were based in London or Cambridge, arguably privileged geographical locations in terms of resources that are easily available

to them to work with. This participant had come to the UK from New Zealand and commented;

“Generally I find the resources I need are available, the books I need are available, in London.” P3

One striking reminder of how a researcher’s geographical location affected the way in which they worked was highlighted by the Australian scholar interviewed. He reminds us how, not that long ago, being geographically dislocated from his contemporaries in Europe and the US slowed down access to materials and communications within the research community.

“Even in the early 1980s Australia was a long way away you know, sending and receiving a letter was a matter of three weeks at least. Knowing, getting a book from the time it was published to the time you’d have it in your hands was a matter of months because you would have to find out the book was published which generally came when you had received a published catalogue or a journal, months after the book was published. I mean you could order it or have it ordered for the library and it might be several months before you actually received it so even speeding up that process – there was a much greater gap.” P12

This scholar had moved to Australia. This is a significant geographical distance from Europe, their original research focus. This change in working environment meant a shift in their research focus, keeping within European themes but concentrating on the history of Colonialism in Asia. So now his new geographical position allowed him easier access to Asia than had they been based in Europe or the US. He describes, when asked about technological advances changing the research experience for a modern researcher, how having access to these physical working environments is still a desirable part of being a humanities scholar:

“Online resources makes their lives easier...going overseas is costly, it’s time consuming...I think it would be unfortunate if they missed that real experience of sitting in a library, of being able to immerse themselves in a particular society, in being able to literally trace what you want to see when you are doing a PhD (linked to that country).” P12

Of note were scholars describing electronic resources as a benefit in that they do not have to constrain themselves to being there. Carrying out much of the research at home or in the office is now possible:

“You know you can just read it from home, it saves you the trip” P5

The issue of access, and the improved access provided via the Internet, was a source of palpable pleasure to many participants. For example, participant 12 noted:

“I have broadband at home. I download things and print out things and so on with great pleasure and you know I am very happy to be able to print out a journal article rather than having to go to the Library, look up the card, you know, then I must go to the shelf, find it, take it down stairs, photocopy it, have the photocopy card, it runs out of credit, have to renew the photocopy card, you know, do all that.” P12

Similarly, participant 4 recalled the time when access had first become possible to remote library catalogues:

“There was a way of getting from the college library catalogue to those of foreign libraries and that was very exciting and before that you would have to write to them or look in a printed catalogue.” P4

However, the contrast between physical and digital access is not based solely on the ease of access. Experiences of working in particular places can be viewed both positively and negatively. Here is an account of one researcher's experiences of a variety of spaces that highlights both disdain and passion for them. This particular excerpt follows on from the participant explaining how he enjoyed buying a book and taking it home to read, rarely enjoying working in the library. When asked if he had ever enjoyed working in the library:

"when I was a graduate student I loved working in the "A" because it is such a lovely place to work. The difficulty here is – I hate working in the "B" library, I think it's a slum; it's an airport lounge, I can't stand "C" library which is even more of a slum; I don't care for "D" very much, so I don't like working there. But when I go abroad ... working in the "E" Library there is very pleasant and I enjoy that, although you don't get much done because people come and talk to you and show you things, there's chat and you can't do long stints... it's not open for very long. But no. When I worked in the "A" I really loved it, I've enjoyed that and I feel really fond of the "A" because it's there but the greatest pleasure is, is reading a book at home and taking notes on it." P2

Similarly, another participant regarded a particular library as 'pretty good', but nevertheless commented that the space available to work within it seemed to engender a dark and gloomy ambience. Here is a description of the participant's time researching at a US institution and being asked what the resources were like:

"They're resourced...it was pretty good actually. And it was a really soul-destroying building actually and that really affected the way I worked...it's a real kind of hardcore Stalinist building but... the library itself was really good...I couldn't work in there. I really struggled; I had to take books out...the university library...it was very, very dark and you would have very, very small desks for undergraduates to go and sit...it was so dark and so miserable, and so kind of imposing...the best way I can describe it...the end of...film ...Ghostbusters and...like shelves you just see that kind of...half a mile of shelves, and they are only like that far apart...just crammed in and with lines, and lines, and lines and lines, and that's it and it was really dark and it's hot and hardly any windows". P14

In contrast, the same participant considered another library environment to be very conducive to working despite problems accessing some of its resources. Also of note is the enthusiasm he expressed whilst carrying out this kind of research activity. Here, when asked what his favourite libraries were, the respondent commented on how the environment can affect the research experience, contributing to 'feeling like a real historian' alongside an original ancient text:

"I love the "B" library to work in, its a pain in the arse to get things out, because everything is, you have to go and order it, but its thirty minutes minimum you know, but I love going in there, sitting in there and working in there. I think it's just amazing as a building and I never really thought about the extent to which the environment affects me, but I really, I always feel a lot, when I am working in the "B" library, and because normally I am working with original text, like eighteenth century text, and nineteenth century text, I feel like a historian, I feel like a, all these people around, and I got these old books and it makes me excited." P14

Another academic offered an account of the value of the broader working environment on a research trip to France. His physical presence in the country, his immersion as it were, allowed him to make connections that sparked his interest and eventually became a book. Being remote from the physical place in this instance would not have allowed for these connections. This was drawn out from a conversation where the participant talked of feeling less 'immersed' in a digital library:

“And sometimes it’s being on site that actually then sparks your interest for another project. I mean my interest in colonial monuments in Paris came from actually working in Paris on a different project... just walking around the city and thinking oh yes, that statue, he was a colonial, that street name that’s a colonial battle and really just by seeing things... which I wouldn’t have been able to do virtually unless someone had planted that idea in a different fashion...just immersing yourself, speaking the languages, looking at the newspapers, walking around the streets, it’s a most you know, irreplaceable experience.” P12

Another common theme raised within the context of descriptions of their working environments was that of a sense of community, and its importance to the experience of being a humanities scholar. When asked about the difference between using electronic and physical texts this scholar offered:

“but it’s also a sense of community, because you know, yes, you can look at the stuff at home with your laptop, but at least if you’re going to the reading room it feels that you’re not the only person doing it...so there are loads of other dusty people, you know somebody to go for a coffee with, there is the idea you are going to a workplace. And there is this sort of feeling, I don’t know if it’s an historian thing, but everyone has it, that your, you have got to have a connection with the people who wrote the books, which is a physical immediate one, or people who wrote the books, so it is that kind of tangible immediacy with your subject. Knowing that Carlyle used this library, knowing that Catherine Macaulay used the British Library, knowing that Marx wrote Das Kapital in that room, that thing.” P7

An attribute of the physical library is that it is possible to meet people face to face, whom as the researcher here reminds us, one might not meet by any other means except by physically being in that particular place. Relationships are often forged with librarians, archivists, book specialists and colleagues locally and globally with similar interests. When asked what qualities of the research experience would be taken away if it was solely electronic the participant replied;

“I mean, being there means you may meet other people who are working in a similar area. Archivists may lead you to things that you wouldn’t think of or that even Google wouldn’t tell you about” (P12 p24)

This researcher explains that individuals that work in these places can influence whether work in a particular area will be done, and how the relationship, for example with an archivist, is very important in the development of the scholar’s work. This extract follows on from a comment made about some UK city archives being more helpful than others and being asked whether this was a level of resistance that has to be faced in his/her work:

“you know if you have a belligerent archivist or set of archives with certain rules then I genuinely believe that that puts off a lot of work being done in that area and, in my own case, the people that are “F” archives in “G” (city) are phenomenally helpful... people at “J” County Archives are blocking you, every step. It’s impossible to get anything done and the archives there... are really horrible, stuffy, little, tiny pokey rooms...I don’t like working there...(it’s) full of pensioners tutting and blowing because you are looking at all this stuff.” P14

While community is developed in an obvious way through physical interactions, some participants were also aware of the value of online communities, particularly through the use of specialist mailing lists:

“Mailing lists are a major part of my research as well. These are specialised lists on particular topics. The one that I subscribe to, well there are two there the Linguist list and there’s the Corpora list and I use them very regularly. If you’re doing a topic you post it up and say ‘I’m

interested in this, this and this, does anybody know about any publications or any research that's been done before?' and it's read by thousands of people and I always encourage my students, postgrad students to use that. You get a great deal of information and you learn about other people's research. People are very generous on those lists and they always volunteer and you get loads of replies that are very, very helpful. On the other hand you get an awful lot of mail on those lists you're just not interested in but when you do need to use it it can be very, very useful you know." P1

To summarise: three important aspects of the working environment were found to be the way the environment supports ease of access to research materials, the experience of being in particular places (their ambience), and the ways in which particular environments support the development of community. Both physical and digital environments have the capacity to provide positive and negative experiences, albeit in different ways.

4.2 Finding Things

A typical library has designed its physical space to allow its users to wander around sections and explore the contents of the open stack shelves. Many of the researchers interviewed described hours, if not days, of this browsing activity. This is achieved by becoming familiar with library environments and the activity of browsing. Several scholars described early interactions within libraries as daunting or intimidating. For example:

"it being quite scary the first few times we go in" P7

"from how brave you were in walking up to scary librarians and saying help, I am lost" P8

Problems are often encountered with inconsistencies between institutions and how different electronic resources operate. There are often differing cataloguing systems between libraries and similarly differing functionality and presentation across a range of digital libraries. Here, for example, a library shelves some resources in an unconventional manner due to physical space restrictions. An advantage of electronic resources is that physical 'space' does not present the same sort of concern.

"No I don't think we even had an orientation in the (University Library), I cannot remember doing an orientation. I remember it being quite scary the first few times we went in, and even now sometimes I cannot find things because it's got its own reference system, which is the same with most academic libraries, they don't follow a reference system or model that's anybody else's? And the "X" Library, have you been there? It's the worst, because they are pushed for space...because of precious space they organise things by size of books. So the folio edition and the Octavo editions are all on particular shelves, you get the kind of idea, and then again they have the ledger system." P7

In terms of learning how to find materials in the library, scholars reported that there had recently been an increased emphasis on research skills training: these observations were offered by scholars across institutions. When asked whether she had been taught how to do research this scholar replied:

"No it is obviously something I have thought about quite a lot with the emphasis now on research skills training things for PhD students now, I've, I can't think of any single instance in which I was *ever* taught to do research other than asking a librarian to show me how to do a particular kind of thing, you know, how do I do a microfilm search, that kind of thing..." P13

Another scholar commented that colleagues, in particular the supervisor, were the traditional source of acquiring research strategies whereby being in the presence of somebody more experienced allows you to absorb this knowledge:

“Osmosis, it’s difficult to know whether by sitting with your supervisor in the tea room at the library, or sitting with your supervisor in the bar at a conference is training but you do get some training from that...” P8

One of the main skills is the “process of learning to discriminate” (P3) and this is increasingly important with the growing amount of information available via the Internet, which has speeded up the process of acquiring background information for research and of becoming familiar with works and authors that may be relevant. This is, of course, helped by...

“a huge amount more emphasis on skills courses becoming aware of facilities and techniques that are available” P3

It is important that scholars gain a level of familiarity with their library environments. The physical environment lends itself to browsing, As well as browsing the shelves, there is a style of browsing through the card catalogue: the recognition afforded by printing on cards was regarded by some as an advantage, particularly if they were not sure how to spell a particular term:

“And the other thing of course there are lots of ways in which electronic searching can limit you, simply because you are on an unhealthy stage, you have got the wrong spelling, or okay, there is sophisticated ways in which they can look for alternative spellings, but its still not the same. I mean all the great advantages of the latterly based system, or a catalogue system, is simply that you can flip through it. And if you have not quite got the right thing, you not necessarily defeats it at that point” P10

The physical organisation of most libraries lends itself to the chance for serendipitous encounters, because other resources in close proximity have strong potential to be relevant to their inquiry. When this scholar was asked how she knew about journals in her research area, she commented on the visibility of these sorts of resources in the physical library and suggested that it is perhaps now harder for researchers who work in electronic environments that lack these physical cues:

“(Journals were) all kind of grouped together by area whereas now they are done alphabetically across all subjects generally speaking, so I guess they are a bit more visible in the physical library than when they are electronic.” P13

The grouping of documents in the physical library is regarded by many as a definite advantage. For example:

“I still do the whole old technique of going to a library and going to the Victorian section and just looking at books on the shelves and taking things out and you do find definitely with doing that.” P5

The physical sense of being surrounded by, even immersed in, books creates a sense of possibilities, of serendipity where discoveries can be made, apparently by accident. Serendipity was mentioned as being valued by several participants. For example, participant 2 highlighted the value of serendipity in physical libraries and antiquarian book shops:

“It’s just serendipity, if they’ve got something that interests you, you pick it up off the shelf, but the computer of course doesn’t allow you to do that in the same sort of way.” P2

Participant 10 explained one of the important roles of serendipity in inquiry:

“And it’s finding, it’s realising that something is important, that you didn’t even know about. That opens up new areas.” P10

While most participants linked the experience of serendipity to interacting with materials in physical spaces, one highlighted the possibility of a different kind of serendipity in digital spaces:

“I am not saying a lot of it is, it’s just random. I came across places randomly on the Web. Or one resource leads on to another. Its just by a link, you know? I came across the resources, the electronic dictionary of rhetorical terms recently. And of course I have bookmarked it. Have it on my favourites now. I think its tied around half my fingers. It was probably through Google, I was searching for some rhetorical terms and it just came up with this site, which having looked at, I could see it was quite good. And so, I think a lot of it is chance really, you know. One thing leads on to another.” P1

One marked contrast between the physical and digital libraries in terms of serendipity is that, whereas participants were generally comfortable being surrounded by books that were of greater or less relevance to them, the analogous experience in a digital library was viewed by most as being unmanageable. For example:

“The biggest challenge for me is to put it in in such a way that it gives a focused and manageable number of results and what I used to find, I think I’m getting better at it, but what I used to find is that I’d either end up getting no hits or I’d get some enormous number and actually try to get it so.” P9

The sheer volume of information that is, in principle, readily available can lead to another challenge in relation to research practice – namely, balancing information acquisition with other aspects of research. One participant offered the following opinion whilst discussing the impact of electronic resources on humanities researchers today, that perhaps more time is spent chasing resources than reading them:

“Academic life is, I think, perhaps unfortunately been too speeded up. That is you’re obsessed with having the latest publication. People spend enormous amounts of time finding sources of information and probably less time in actually reading those materials. There is a great incentive to publish...yes, well I think there is less chances of gestation.” P12

Conversely, when the user knows what material they are looking for (in a focused search), digital libraries are much less prone to temporary disorganisation that disrupts the search than physical libraries are:

“I have much more frustrating experiences in physical libraries. Where the book is mis-shelved or it is in the wrong place, or it’s on the trolley, and how do you know it’s on the trolley. But actually in the electronic environment it’s, I haven’t had experiences like that. The search engines are so good these days, that if it’s there, you will find it.” P1

Requests to libraries for documents are almost exclusively carried out online, which reduce the physical space required for paperwork as well as speeding up the processes. Here is an example of a small reference book being replaced by online information. In effect this means that the information required is no longer confined to one physical space (the book), which can be lost or left behind, but is now distributed and available anywhere there is an active Internet connection:

“I mean I have got still somewhere, in a box a little booklet which I bought once which has all the addresses of the county record offices and I don’t need it any more because I can just search for them on Google and that sort of simple little thing you know and it has made things miles easier.” P4

In summary, physical and digital libraries are perceived as offering different possibilities in terms of finding information. On the whole, physical libraries are perceived as better supporting serendipitous and browsing interactions, because of their physical layout (with related items typically being co-located). Conversely, digital libraries give access to a greater body of material, and better support focused searching.

4.3 Working with Artefacts

Even in the experience of findings documents, there is often a tactile aspect of the physical library environment that researchers enjoy. The traditional card catalogue system offers a different means of searching the library’s stock compared to the typical digital interrogation required of an electronic database catalogue system. When asked if he had found the card catalogue easier to use than the computer catalogue:

“I rather liked standing at a card catalogue and going through. In fact I can’t say that I missed that but there is a certain... Your eyes go through it in a different fashion. The fingers go through in a different fashion.” P12

This theme of the value of being able to touch and feel materials emerged in other interviews. Many researchers are interested in the materials used to make up their sources, for example: Participant 2 laid store by the additional information implicit in the material properties of the historical artefact:

“Only by looking at the original document can you recover certain sorts of material features which are important, which I’m interested in, the most obvious being looking at the paper – I spend a lot of time looking at the paper of the books that I’m reading because I want to know where the paper came from, can I learn anything distinctive by looking at the paper? Yes, a lot of the time I can. It’s a sad world when you discover that paper is what you’re really interested in but I can go on about paper for hours and hours, but also other things – the binding of a book tells me a lot and obviously they don’t reproduce that in [digital media].” P2

Davis-Perkins *et al* (2005) raise a similar point in relation to the archiving and use of historical photograph collections. While the digitisation of photograph collections improves their accessibility, and makes it possible to “improve citizens’ sense of self and their society’s historical context” (p. 278), the digitisation process itself loses information “through manipulation and accidental loss” (p. 282) which makes the resources of less value to specialists.

As well as the additional information embodied in physical artefacts, the sense of authenticity was reported as being important to many participants. Here is a description of the lure of medieval manuscripts that England had available to a researcher from another country when asked if they were wanting to come to England to work on a specific project:

“when I came over, I didn’t know what the specific project would be, I just knew I wanted to work in the medieval period, and I wanted to work with manuscripts” P3

Although digital copies often attempt to replace the need to see original material, interaction with old and original artefacts is one of the pleasures many described.

“My favourite resources are my texts, my 18th century texts, I like my original text” P7

The scholar here refers to research that was predominantly carried out in a prestigious library. This was perceived to be “real, real research” and implied here is a kind of exclusivity in that not many other people would have accessed these resources and that is a feeling that you do not get online. Here he has been asked whether he feels he has benefited from his earlier experiences in physical libraries:

“I think I have benefited a great deal the best time I have spent in my life was in “B” library doing my PhD research yeah being buried under dusty volumes. But that was real, real research...”B” were so wonderful that I never requested a book that they didn’t have, ... and you felt like you were going right to the source. I mean I was looking at original 18th century manuscripts you know which I have to say very few people would have actually looked at you know, it was a very specialised topic you don’t get that feeling with online electronic texts” P1

Another scholar described the ‘buzz’ of handling ancient documents, but once that experience has been had, the important aspect of it, as far as he and his research is concerned, is the information derived from that artefact. Here the participant was asked to describe what a good experience in the library would be other than finding what he came in for.

“once you have the experience of, holding a document and touching the seal and thinking, yes, the King sealed this himself with a signature ring 647 years ago, once you have done that, you’ve done it. And there is something absolutely magical about it. But ultimately, what matters is the information and if it is available in an electronic form, if it were all scanned in, I could just summon it all up here, that is what I would do.” P10

The reliability of the information in digital surrogates was a concern raised by several of the participants. Common criticisms aired in the interviews concerned accuracy, quality and credibility of electronic resources.

“what makes a good on-line resource for you?”

“...the main one is accuracy. I find that a lot of the ones I use...are just not accurate enough for what I need. But I keep on having to remember that they’ve probably got it wrong, simply because they’re badly keyed in. “H” for example is full of mistakes so is the “I”. Every time you think you’ve got an accurate text on Shakespeare you discover they’re full of mistakes and so you search it and you think: no, this doesn’t occur in Shakespeare or this spelling doesn’t occur in Shakespeare then you think again...” P2

Human input errors would seem to be the most common complaint. When asked if using electronic resources has changed the way he thinks about research and whether the experience of carrying it out is better or worse, participant 1 responded:

“first of all I’m aware that there are problems with these electronic texts I’m also aware that if you weren’t an experienced researcher you could get very carried away with all these wonderful data that’s available and do all sorts of wonderful studies on these texts not realising that they are full of inaccuracies. I wouldn’t say full of inaccuracies some are better than others... And some texts are really very bad electronic texts and it’s something we have to be very careful with our students and tell them about to be very, very wary of these things. So on the one hand it’s got easier, it’s much easier to get these data but we really need to be very careful otherwise there’d be no accurate data at all so it’s swings and roundabouts” P1

The value of the physical, printed book or journal is deeply embedded in the scholarly culture of the humanities, to the extent that scholars still appear to rate printed items more highly than digital ones as objects of study. The participant below, when asked whether citing electronic versions of texts caused any problems of credibility in their field, reported that they would cite the print editions of texts, as they believe they are more reputable in scholarly terms.

“People would, you tend not to cite electronic versions in scholarly work, you would tend still to cite hard copy editions. [...] It’s because for all of these medieval texts there’re enormous amounts of editorial input, and so that you are relying on the work of previous editors and interpreters of the texts, and that tends to have been published in, sort of, standard editions, which you would be expected to use. So that any other text, I mean, yes it must be possible and there are some electronic texts available that one can cite, but I tend not to.” P3

There was also criticism that some Humanities digital library projects are too expensive and exclusive, with a narrow user base, badly thought-out and poorly maintained. Another complaint levelled at some electronic resources is apparent glitches in the software’s performance. These occurrences are usually system errors or examples of system behaviours that were unexpected, illogical or plain wrong, as illustrated below by participant 5 when she was asked why she did not like a particular library’s online catalogue:

“When I search with their catalogue it seems to throw up the most random works a lot of the time. You will look up biography and it will come up Scandinavian poetry from the 1930’s or something and I’m not quite sure how it got in there.” P5

Users were also frustrated by an inability to adequately search a digitised resource; as a result, using the physical resource might in fact be quicker in some cases:

“They are not searched for though, they are just scanned, “J” magazine is one I use and that’s available online but just scanned... you can just read it from home, you know it saves you a trip.”

Interviewer: “Obviously you can search and find titles and dates?”

“No you can’t even search that, no it literally is just scanned and then find an issue and then you have to just read through it.” P5

Another problem that faces developers of digital resources for the humanities is deciding which edition of a text to digitise. For example, it was relatively common for manuscripts to have annotations that may or may not have been reproduced in printed form. Some scholars were frustrated that the most suitable edition for research purposes had not always been chosen. Although variorum editions such as the Canterbury Tales Project and the Internet Shakespeare Editions Project do exist, most commercial publishers choose to digitise a single first edition because of copyright constraints. This may not suit the needs of users however,

“for some projects you really do need to see the originals. I have an acquaintance who does book binding and that sort of thing and you know, you actually do need to see the physical manifestation of it or I guess if your working on old materials, sometimes variations between one edition and another, or even one impression in another, are quite significant if your working on that sort of topic so it doesn’t always replace looking at it.” P12

The most common use of electronic resources of digitised physical objects (e.g. books and other scholarly work) reported in the interviews was as a convenient reference tool, for example, enabling quick access to a particular quotation (that may then be checked against a physical copy).

“I would just read it and then I look up the book because you want to check that they got the page number right and that they got the edition right because sometimes there are mistakes.” P5

However, it is too simplistic to suggest that scholars must either use physical or digital resources. Below is an example of how a researcher, having seen the original physical documents, was able to use the electronic records more effectively. He had noticed that the original ledgers described children’s causes of death as smallpox and cowpox that were likely to be different descriptions of the same thing. This meant he was able to interact with the electronic version more effectively than if he had not seen the original artefact:

“Because I typed in smallpox and like not a great deal came out, and then I found cowpox and then because I knew that there is a relationship there, so I typed in that, but then also, I actually kind of worked it out, because when I am looking at parish registers then it kind of clicked to me why it wasn’t working because when you look at parish registers the cause of death, it’s all different, you know, it’s all written out differently, so then you learn to do that, to put that in there...” P14

Finally, and unsurprisingly, the physical properties of paper and screen were raised by several participants. Many interviewees described an unwillingness to read for long periods from the computer screen, opting to send them to their printer. These findings are in keeping with those reported by King & Montgomery (2002) and Liu & Stork (2000). Many people search or browse digital documents and then prefer to print them out for an in-depth reading. They find it easier to have several sources out in front of them from which to work. Such physical copies allow cross comparison and hand written annotation on these documents. When asked what digital libraries s/he used:

“I use that Gutenberg. But I can’t sit and read a book on it, and I can’t read a book on the screen...I couldn’t sit and read, you know George Eliot or, or Jane Austin or whatever off a screen in courier, you know, size ten font. I just couldn’t do it.” P14, p29

However, printed copies of documents lack the distinctiveness of the originals than allow one to discriminate easily between them. Participant 4 describes the benefits of taking notes from an original rather than relying on printing out a copy and taking it away to work on at a later time. This describes how the physical constraints of the library and its resources can actually make the researcher more efficient. Printing off reams of A4 paper means that different resources can be collected (in this example, within a binder) but they lose the individual characteristics of the original source material. Furthermore it can prove more difficult to search through annotations and highlighted text than through notes ‘picking the most important things out’ at the time. This may suggest that the researcher has a deeper engagement with these original materials than the digital copy or a printout of it. Here the participant is answering the question of what online resource he valued highly:

“because I print this stuff off, and it sounds awful, I don’t really read it and when I do read it, I find it a bit of a chore because...its...hard to concentrate on ...it doesn’t look right or feel right because it’s just on A4, in a binder, whereas if you have the book in front of you...you know that you have to get the train home tonight, the library shuts at six, you’ve got to sit down, you have to read it out and you’ve got to pick the most important...things out, and making note of them, or typing it out, whereas you have got these piles of gear...piles of stuff...at varsity, I got piles like that, just with highlighting and lines next to it, I can’t find it, I don’t know where this stuff is.” P14

To summarise: it was found that participants in this study value the physical properties of original documents for various reasons: ease of reading; trust in the content; the pleasure of touch; and the sense of privilege of working with originals were all cited. In many cases, though, digital surrogates were recognised as having value provided that they are reliable, easy to use, and match the scholars' needs (e.g. regarding which editions are available in digital form).

5. Discussion

It became clear in this study that humanities scholars are very aware of the details of their information environment and its affordances. As we have found with other user groups (Makri et al 2006), they are capable of constructing very complex mental models of physical information environments. The literature also shows that they need a great variety of types of information, and are thus adept at finding the ideal piece of information from a wide range of sources (Stone 1982; Watson-Boone 1994). This suggests that they are likely to be able to employ the same skills in a digital realm, making them very perceptive but potentially very critical of the digital information landscape. They are thus a very demanding user population for which to design. Here, we review what has been found, from the literature and from this study, and identify some implications for the design, deployment and maintenance of future digital resources as they relate to their physical counterparts.

There has been great enthusiasm for digitisation of historical documents, the research material of many Humanities scholars, and substantial resources have been invested in digitisation projects. As noted above (section 2), digitisation holds out the promise of making such documents readily accessible to a broader population of readers and scholars, and also raising the profile of the hosting library. However, the literature reports some apparently contradictory outcomes of digitisation:

- Rather than reducing demand for accessing physical originals, digitisation has been found to increase demand for such access.
- In some cases, people have been found to prefer electronic to print journals, because it improves access and enables remote working.
- “If we build it they will come” has been found to be, in many cases, a fallacy, with many digital resources having limited use.
- Poor image quality in digitisation can cause people to engage less well with digital documents.
- Even when only the digital document has been accessed, it is the physical document that is cited.
- The uniformity of digital presentations (particularly printouts) can make them less engaging than interactions with physical originals.
- The media used (paper, books, shelves, etc. or screens, keyboards, mice) afford different kinds of interactions.

The study reported here has confirmed many of these findings, but also established a richer set of relationships between the physical and the digital for Humanities scholars.

The focus of this study was on the library as the “humanist’s laboratory” – i.e. focusing more on their use of documents as objects of research than on their use of the research literature (typically reported in monographs and journals) within their specialist areas of interest.

If digital documents do not offer any added value (e.g. being searchable or annotatable) then their only advantages is that they are accessible from many places at any time (regardless of whether or not someone else is using the same document at the same time). This accessibility does mean that scholars can effectively have a large “library” in their chosen place of work, typically office or home; however, that library lacks many of the features that make “working in the library” an experience that is differentiated from other kinds of work. The physical library evokes a range of (often strongly expressed) emotions, from delight to despondency, depending on the way the design is perceived by users. The activity of going to the library is usually viewed as being tedious and mundane, except where that library is in a novel and interesting location, in which case going there augments the experience of doing research.

One feature of the library that has received relatively little attention previously is its role in fostering community. Borgman (1999) recognises that libraries provide information “on behalf of a community of users” (p.231), but the physical library is also a place in which people (both scholars and archivists) meet by virtue of a shared interest in co-located materials. Specialist email lists were reported by some participants as creating valuable contacts for exchange of ideas and information via the Internet; there is scope for further developments to support on-line communities based around shared interest in particular digital artefacts or closely related documents.

The primary ways of finding materials in digital and physical repositories are different: the physical organisation of materials in traditional libraries is perceived as better supporting browsing activities, whereas digital documents are more easily searched for. The context of digital documents is often lost, in that closely related documents are not apparently any ‘nearer’ a retrieved document than those that are completely unrelated. New means of browsing in digital libraries could improve scholars’ perceptions of serendipity when working with digital documents. Better representation of aggregate works (Buchanan et al 2007) would also help set digital documents within their original context, improving the potential for understanding that context and locating related materials.

Physical libraries provide staff that often have valuable knowledge of the institution’s archiving and can help researchers find pieces of information that would be harder, or even impossible, to locate without their aid. It is known that a lot of electronic resources are poorly maintained after a project has been completed (Warwick et al 2006b), and that this can damage the trust a scholar has in electronic resources. Perhaps more digital libraries could provide a contact to someone with a good knowledge of the resource in order to help with researchers’ questions. Understanding the navigation of both physical and electronic environments can take time. At least interaction at a human level allows you to ask questions and get immediate feedback.

Original documents will always have an authenticity and “magic” about them which cannot be replicated by digital surrogates. They will also be inherently more reliable (in the sense that they are not copies, and so cannot have ‘errors’ introduced through modern reproduction processes). Trust in digital surrogates was highlighted as an important issue, and there is a clear need to ensure quality production and ongoing curation of digital resources.

There has been a long tradition of attempting to substitute the ‘old’ technology of paper with a ‘new’ digital substitute (Sellen & Harper 2002). Lancaster (1978) predicted that electronic information systems would replace paper-based systems in the sciences by the year 2000. Despite these claims not proving entirely true, it is becoming increasingly common for physical objects to be replaced by digital versions. Our study provided no evidence that access to digital surrogates reduced demand for access to physical originals. The power of the physical book as a cultural object of study is as strong today as it was when Flanders (1997) discussed such issues, despite the far greater number of digital surrogates that are now available to scholars. As Duguid (1996) argues, the survival of the pencil even in the digital age argues that not all technologies supersede each other, but may instead be complementary, depending on the task in hand. The art of the designer is then to be able to recognise when this may be the case and develop new resources accordingly.

This study has highlighted the complementary roles that physical and digital documents can play in supporting research, provided that the digital copies are sufficiently faithful reproductions, easily searched for and worked with. Scholars value the efficiency gains from being able to locate and interact with digital resources, which can save time before visiting a library that may be quite a distance from home.

The value of well designed physical libraries, as places to study and interact, must not be underestimated, and it seems likely that they will continue to colour the experiences of Humanities research. Physical interactions, with both the artefacts and the library that houses them, encourages a deeper engagement with the materials and a better understanding of the context within which they are organised. Well designed digital libraries, interconnected and easily accessed, can further enrich those experiences, but should not be regarded as simple substitutes for their physical counterparts.

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Appendix A Semi-structured interview script

- Please describe your academic career from the late years of school up to now.
- What areas of research have you been involved with - past and present.

- What are the main activities for you whilst undertaking research?
- Is there anything you are working on at the moment?
- Can you tell me about the resources that support your research processes?
- Which ones are preferred and why?
- I'd like to talk to you about your use of libraries – what are your comparative experiences of different libraries?
- What makes a good library?
- How do you use them – indexes – staff – colleagues?
- Do you use any electronic resources?
- What's your own history of using electronic resources over the years?
- Positives and negatives of using these?
- What digital libraries do you use?
- What makes a good digital library?
- What sorts of features do they have and what is their value to your research?
- How have they affected the way you work?
- Can you tell me a little about the perceptions of/credibility of electronic resources in your own field of work?
- Some see them as non-traditional and weaker than using physical real world books and manuscripts – to what extent do you think this is true?
- What is the most common electronic resource you use (and why?)
- In your field is there an issue of “hoarding” (keeping a resource for oneself and not sharing)

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